Case Study: Disinfection Control and Chlorate Reduction
Dairy Infant Formula Production

Client Visentia Ltd - New Zealand

Dioxide's Role Generator Manufacturer

Project Description Chlorine gas generator for process water disinfection

Works Undertaken

- Manufacture and supply of HG-10-G electrochemical chlorine generator
- Assistance with commissioning and training

Site Details

- Dairy Processor – New Zealand
- Major customer product: Infant Formula

Highlights and Innovations

- Process water is used as a product ingredient and for washing.
- Customer was originally using a 2-chem chlorine dioxide generator for process water disinfection.
- Infant formula is continuously tested for chlorate and perchlorate. Since reaction by-products of chlorine dioxide are chlorite and chlorate, risk existed for chlorate to be present in product.
- Replacement of the 2-chem generator with electrochemical ClO_2 was assessed, but though lower concentration, chlorate still present with any ClO_2 generator.
- ClO_2 replaced with Dioxide Pacific Electricide HG-10-G chlorine generator. Chlorine gas is generated from Electricide-B1 brine solution to produce chlorine gas on demand in the generator.
- Chlorine gas generation has proven over 1.5-year operation to produce no detectable chlorate in the water and in product.
- Incoming process water is from municipal WTP source. Free chlorine concentration has significant variation. Minimum zero, maximum 1.5 ppm. Desired setpoint is 0.45 ppm in the chlorinated water storage tank. The chlorine generator adds chlorine automatically to control to 0.45 ppm in the tank. Control methodology is Flow Paced Residual Trim (FPRT). Water flow, incoming Cl residual and Cl residual setpoint are all combined in the FPRT algorithm. The control results are excellent.

Summary of Why Our System Was Installed

- To greatly reduce chlorate concentration in process water.
- To have on-site generation of chlorine and control to compensate for variability of municipal chlorine dosing.
- To reduce safety risk by only having to store Electricide-B1 brine solution which is non-hazardous.

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